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Agricultural Extension Model based on Local Wisdom in Creating Household Welfare in the Dayak Tunjung Tribe Community, West Kutai Regency

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Agricultural extension is non-formal education for farmers which includes extension activities, knowledge and skills for farmers and their families which takes place through a teaching and learning process. Agricultural instructors must be able to guide farmers, instructors also provide motivation, provide information and increase farmers' awareness so that they can encourage their interest in learning in facing problems in the field. Local wisdom is a view of life and knowledge as well as various life strategies in the form of activities carried out by local communities in responding to various problems in meeting their needs. The traditional culture of the Dayak Tunjung Tribe in West Kutai is rich in various local wisdom and plays an active role in preserving the environment. Local wisdom is the noble values that apply in community life to, among other things, protect and manage the environment sustainably. Local wisdom not only understands the knowledge of indigenous/local communities between humans and how good relations between humans are, but also concerns knowledge, understanding and customs about humans, nature, and the relationship between all, where all knowledge is lived, practiced, taught and passed on from one generation to generation. The Dayak community as local farmers have local wisdom in farming and opening farms. The Dayak community does not burn forests except for farming, and this is also done through traditional calculations that have been taught from generation to generation. The aim of this research is to analyze the factors that influence changes in farmer behavior towards household welfare in the local wisdom of shifting cultivation. This research approach uses a mixed method approach. In this research, it uses a sequential explanatory design where the first sequence uses quantitative methods, and the second sequence uses qualitative methods. The number of samples (n) in this study was 110 farmers. The data analysis used is GSCA, which is an analysis that combines the characteristics found in PLS-SEM with Covariance Based Structural Equation Modeling (CB-SEM). Based on the research results, it was found that factors influence changes in farmer behavior in improving the welfare of farmer households, namely: (1) internal factors of farmers which have a significant influence on changes in farmer behavior in farming. Factors that do not influence changes in farmer behaviour are: (1) external factors of farmers and (2) the role of extension workers does not have a real influence on the farming activities of the local Dayak Tunjung Tribe community. Changes in farmer behaviour in the shifting agricultural activities of the Dayak Tunjung community, namely knowledge (Y1.1), attitudes (Y1.2), and skills (Y1.3), all of these indicators have a real and large influence on improving farmer welfare. farmer household. This means that in order to improve the welfare of farming households, farmers must change the behaviour of farmers in carrying out shifting cultivation activities in Barong Tongkok District.

Keywords: Agricultural Extension Based, Local wisdom; household welfare, Tunjung Dayak tribe,Non-formal education, Extension activities, Local wisdom, Environment preservation, Sustainable agriculture, Farmer behavior, Internal factors.

INTRODUCTION

Agricultural extension is non-formal education for farmers which includes extension activities, knowledge and skills for farmers and their families which takes place through a teaching and learning process. Agricultural instructors must be able to guide farmers, instructors also provide motivation, provide information and increase farmers' awareness so that they can encourage their interest in learning in facing problems in the field. Empowerment through the implementation of agricultural extension is needed to change thought patterns, attitudes and behavior in order to build a better life for farmers in a sustainable manner. The role of extension workers according to (Putri and Safitri, 2018) (Maridi, 2022) [A2], agricultural extension workers have a very important role as a catalyst for agricultural development.

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The government has also designed many programs to facilitate farmers with the help of agricultural extension workers. Agricultural extension workers have a function in innovation and technology transfer. One of them is application in the field, implementation and instructions for activities that must be carried out to adopt an innovation, and dissemination of the best techniques for carrying out cultivation.

The learning process in the adult education system shows that farmers are the subject of a learning process that has the potential to be developed based on farmers' abilities, so that agricultural instructors will only act as facilitators, dynamics and motivators in helping farmers identify and analyze regional situations, formulate action plans, implement action program and ends with an evaluation of the implementation of the joint extension program. Therefore, agricultural instructors need to plan extension programs with farmers with local potential supported by government regulations to improve farmer welfare. The rotational farming system is a rice planting technique that takes into account the following factors: selecting land, slashing, felling, burning, excavating, and harvesting. As an agricultural activity, the shifting cultivation system is often misunderstood by the government and modern society as an activity that damages the environment (Mathilda *et al.*, 2021).

Shifting cultivation is a traditional agricultural system commonly practiced by indigenous peoples. This shifting cultivation has existed since 10,000 years BC. The technique of changing fields is carried out by the process of clearing land in a certain area, cutting down and burning the forest, then planting various food crops such as rice, corn or cassava. Land transition techniques are very dependent on climate because climate greatly influences the timing of burning and planting land. In the dry season, people cut down trees and then burn the land, but when the rainy season comes, people plant seeds in the fields. Land used for shifting cultivation continues to be used for a very long period of time. Land that is used as farming will be abandoned within 2 to 3 years, because the land is no longer productive.

Shifting cultivation activities of the local community of the Tunjung Dayak Tribe in Barong Tongkok District, West Kutai Regency, is understood by local communities as local wisdom where knowledge and skills are only obtained from previous communities, and local wisdom in farming is only carried out by native local communities who Since birth, he has lived in a community commonly known as the Dayak tribe. According to (Lung *et al.*, 2018) [A5] The swidden system is a traditional agricultural system, a transitional system from the gathering culture stage to the planting culture stage. The emergence of the farming pattern system (behuma) was a stage in the change in human culture from a hunting and gathering culture to a farming culture. Almost 80% of indigenous Dayak people in Kalimantan earn their living by farming, farming is not just for living, but farming also forms the civilization of the Dayak tribe because from clearing the land to the end of the harvest there are rules that must be obeyed. The management of shifting cultivation cannot be separated from the local wisdom of cultivation using the term slash and burn, which states that if it is not burned, the land is not ready to be planted with rice, because the land is not considered to have no natural fertilizer from the burnt results, meaning the land is not yet fertile, does not have nutrients. , and soil fertility based on the experience of local communities can only be obtained by burning weeds or large plants to make natural fertilizer (Mardawani *et al.*, 2022). The study of farming from the perspective of the philosophy of life and meeting the needs of the Dayak Tribe in Sintang Regency is synonymous with farming life because it has been carried out from generation to generation since the time of our ancestors. Farming is not only to meet food needS, it also preserves farmers' ritual spiritual ties with the land and their ancestors. Furthermore, local people in farming do not provide organic fertilizer to their plants.

Based on the background above, the aim of this research is to analyze the factors that influence changes in farmer behavior towards household welfare in the local wisdom of shifting cultivation.

MATERIALS AND METHODS

Types of research: This research approach uses a mixed methods approach in this research using a sequential explanatory design where the first sequence uses quantitative methods, and the second sequence uses qualitative methods. This research combines quantitative data and qualitative data to obtain a more complete analysis. Another reason is that not all problems in the study of social sciences (social phenomena) can be explained or resolved just by applying statistical analysis, so research using qualitative analysis is required.

Research Subjects: Farmers who work on land that develops agriculture as shifting cultivation is the main source of income for family food in Barong Tongkok District, West Kutai Regency as a research population of 150 farmers.

The sampling technique was carried out in stages (multi-step random sampling). Determining the research location and sample was carried out as follows: the first stage, looking for the number of villages as sample locations. Three villages were chosen purposively with consideration as villages that have a lot of agricultural activities and preserved wisdom and have a number of farmers who are members of farmer groups. The second stage is to find the number of farmer groups in each village proportionally (proportional random sampling) from the number of farmer groups in each village. The third stage is to find the number of farmers in each group using proportional random sampling. Randomization of samples using lot technique in each farmer population as a predetermined sample so that the sample size of all farmers

from the selected group is obtained. Determination of the sample size is calculated using the Slovin formula, in (Warangkiran *et al.,* 2021)

$$= \frac{N}{1 + N(d^2)}$$

Where: n = Number of samples; N = Total Population; d = 5% precision (tolerable error limits between 1%, 5%, and 10%).
Based on the Slovin formula, the number of samples (n) in this study was 110 farmers. The distribution of samples based on location and population in each group of sample farmers can be seen in table 4.1. The sample size for each farmer is based on the formula:

$$\text{Farmer/village sample} = \frac{\sum N\ petani/kelompok}{\sum N}\ x\ \sum n = Tot, n$$

Table 1. Sample distribution based on population and research location in Barong Tongkok District.

No.	Village	Farmer group name	Total population of farmer group members	No. of samples
1	Asa village	Let's be Tanah	30	22
		Tai agreed	35	26
2	John Asa	It's time	40	29
		Hopeless	45	33
	Total		150	110

Based on the Slovin formula, in this study the number of samples selected was 110 farmer respondents and quantitatively using modeling tests (SEM) with the SmartPLS approach which is planned to be used in data analysis, the number of samples has been fulfilled. SmartPLS analysis can be used for small samples (between 30-50). Based on numbers (above 150). Based on the number of samples of farmers in Barong Tongkok District, the suitability of the sample size using SEM analysis with the SmartPLS approach used meets the suitability requirements.

***Data Collection Techniques*:** This research is field research with a qualitative approach, therefore, a number of data are needed to answer the main problem of this research. The data collected is in the form of primary and secondary data. To facilitate data collection, researchers use tools in the form of questionnaires to interview respondents, cameras to document several research activities. Primary data was collected from direct interviews with extension workers and shifting cultivation farmers who were guided by questionnaires that had been made and conducting in-depth interviews with agricultural extension workers and traditional institutions. Secondary data was obtained from the sub-district office, extension center, Agriculture Service and traditional institution office.

In this research the main instrument was used for data collection. The previous use of the questionnaire met the criteria for validity and reliability, therefore the questionnaire was used as a test outside the research population that had been determined and had the same characteristics as the research location. The location of the instrument was carried out in Kampung Asa Village, Barong Tongkok District, West Kutai Regency with a total of 20 respondents with test results in Table 2.

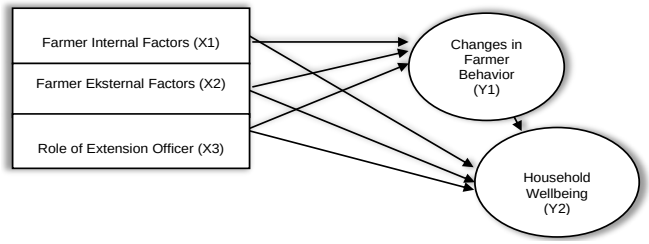
Table 2. Validity and Reliability of Instruments.

Variable Type	Value validity	Reliability value	No. of items	Information
Internal factors	0,59-0,60	0,98	6	Valid and reliable
External factors	0,59-0,67	0,96	15	Valid and reliable
Role of extension officer	0,59-0,60	0,99	15	Valid and reliable
Changes in farmer behavior	0,59-0,60	0,99	9	Valid and reliable
Household welfare	0,58-0,59	0,98	6	Valid and reliable

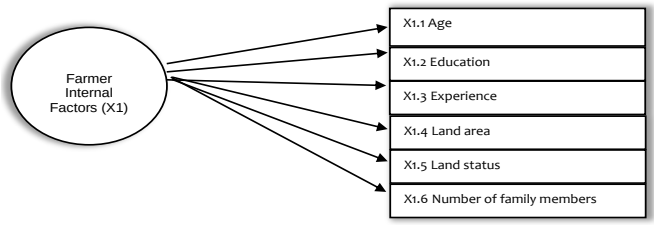
Based on table 2, it can be concluded that all indicators have a correlation value above 0.3. This shows that all question items on all research variables are valid. Cronbach's Alpha Coefficient Value, all variables have a coefficient value in the bag of 0.5 so that the seven research variables are declared reliable.

DATA ANALYSIS TECHNIQUE

***Teknik Analisis Generalized Structure Component Analysis (GSCA)*:** GSCA is an analysis that combines the characteristics found in PLS-SEM with Covariance Based Structural Equation Modeling (CB-SEM). GSCA is like PLS-SEM which can accommodate latent variables with many indicators and requires goodness of fit model criteria and there must be a correlation between indicators and constructs as well as CB-SSEM. The Variance Based approach with GSCA is oriented towards predictive analysis. GSCA has advantages, including: (1) model and indicator specifications can be reflective or formative, (2) structural models have great complexity with many constructs and many indicators, (3) the number of samples does not have to be large and does not require the assumption of multivariate normality, (4) model evaluation requires fulfillment of goodness of fit criteria. Design[A3] of the structural model functions to explain the relationship between latent variables. Designing a structural model requires exogenous (X) and endogenous (Y) variables.



Figurre 1. Model Structural (Inner Mode)



Figurre 2.Reflective model of farmer internal factor variables (X1)

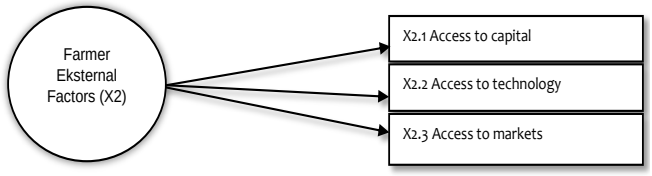


Figure 3. Reflective model of farmer external factor variables (X2)

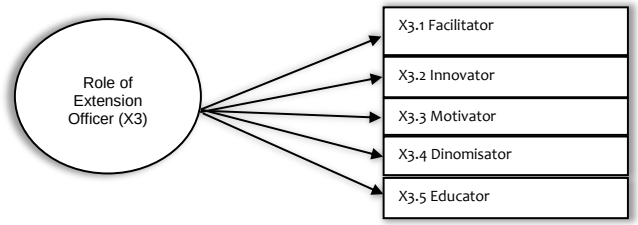


Figure 4. Reflective model of the role of instructor variable (X3)

Table 3. Indicators of Farmer Internal Factors

Farmer internal factors	Category	N (people)	Percentage (%)	Come on, convey it
Farmer age	10 – 25 years	0	0	46,15
	26 – 35 years	14	14,14	
	36 – 45 years old	44	44,44	
	46 – 55 years old	28	28,29	
	> 56 years	24	24,24	
Total		110	100	
formal education	No school	2	2,02	3,47
	Not the end of elementary school	4	4,04	
	End of elementary school	29	29,29	
	Graduated from junior high school	38	38,38	
	Finished high school	27	27,27	
	Campus	10	10,11	
Total		110	100	
Farming experience	1-5 years	15	15,15	16,83
	6-10 years	26	26,26	
	11-20 years old	39	39,39	
	21-40 goat	28	28,28	
	>41 years	2	2,02	
Total		110	100	
Land Status	Own	110	100	3
	Customary Property	0	0	
	State owned	0	0	
Total		110	100	
Land area of arable land	Narrow (0-0.5 hectare)	5	5,05	0,83
	Currently (0.6-1 hectare)	101	91,91	
	Area (1.5-3 hectares)	4	4,04	
Total		110	100	
No. of family members	Height (> 5 people)	23	23,23	
	Medium (3-4 people)	65	65,65	2,04
	Low (1-2 people)	22	22,22	
Total		110	100	

Source: Primary Data, 2023.

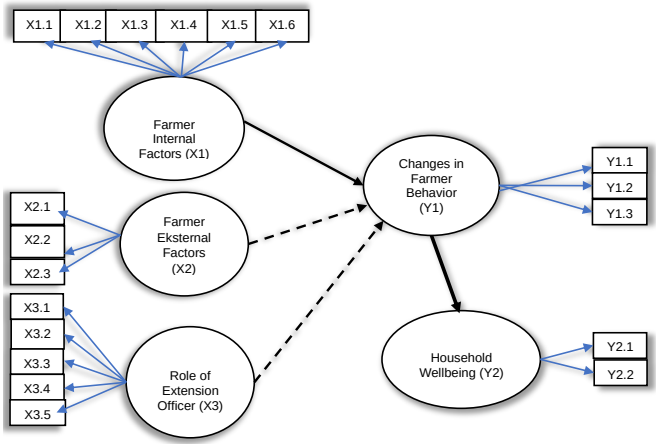


Figure 5. Path Diagram Construction

RESEARCH RESULT

***Farmer Internal Factors*:** Internal factors of farmers can be described in terms of special characteristics inherent in farmers. Indicators of farmers' internal factors are described in category form to facilitate descriptive analysis. The internal factors of farmers measured in this research consist of age, education, farming experience, area of cultivated land, land ownership status and number of family members. Table 3 shows the proportion of respondents based on the distribution of farmers' internal factors in Barong Tongkok District.

***External factors for farmers*:** Farmers' external factors are factors that exist in the environment where a person works that can influence decision making. Factors that can change the behavior of field farmers in making decisions in this research are how field farmers interact with agricultural extension workers at the research location, which can be seen in, among others: access to capital, access to technology, access to markets. An important role that can change farmer behavior is environmental conditions, so interaction and communication between farmers and agricultural extension workers at the research location is very important. Agricultural extension can also be said to be non-formal education which aims to change farmer behavior in order to develop the potential of field farmers to improve themselves and their environment. A complete explanation can be presented in Table 4.

***The Role of Agricultural Extension*:** The role of agricultural instructors is to help farmers to obtain information and knowledge about current agricultural developments in order to achieve a better life, to help farmers to increase success with all its consequences by providing farmers with broad insight which can be influenced by various social and economic aspects. This research can be seen from the interaction of extension workers with farmers including: facilitators, innovators, motivators, dynamic and educators. For more details, see Table 5.

Table 4. Indicators of Farmer External Factors

External factors	Category	N (People)	Percentage (%)	Track
Access to Capital	Very low	42	38,18	1,68
	Low	63	57,27	
	Height	3	2,73	
	Very high	2	1,82	
Total		110	100	
Access to Technology	Very low	19	17,27	1,89
	Low	85	77,28	
	Height	5	4,54	
	Very high	1	0,91	
Total		110	100	
Market Access	Very low	74	67,27	1,35
	Low	34	30,91	
	Height	1	0,91	
	Very high	1	0,91	
Total		110	100	

Source: Primary Data, 2023.

Table 5. Indicators of the role of extension agents

	Category	N (people)	Percentage (%)	Come on, convey it
Provider	Very low	29	26,36	2,18
	Low	45	40,91	
	Height	23	20,91	
	Very high	13	11,82	
Total		110	100	
innovator	Very low	29	26,36	2,04
	Low	63	57,27	
	Height	3	2,73	
	Very high	15	13,64	
Total		110	100	
Motivator	Very low	35	31,81	1,86
	Low	57	51,82	
	Height	12	10,91	
	Very high	5	4,55	
Total		110	100	
Dynamic	Very low	26	23,64	2,12
	Low	49	44,55	
	Height	26	23,64	
	Very high	9	8,18	
Total		110	100	
Educator	Very low	27	24,55	2,11
	Low	44	40	
	Height	18	16,36	
	Very high	10	9,09	
Total		110	100	

Source: Primary Data, 2023

***Factors Influencing Changes in Farmer Behavior in Shifting Farm Activities of Dayak Tunjung Tribe Farmers in Barong Tongkok District*:** Analysis of determinants that influence behavioral changes in shifting cultivation activities in Barong Tongkok District, West Kutai Regency using SEM-GSCA analysis. In general, the linearity test aims to evaluate whether the form of relationship between the independent variable and the related variable is linear or not. Researchers

use SPSS assistance in evaluating linearity assumptions. The relationship between the two variables is said to be linear if the test significance value is smaller than alpha (5%/0.05). The test results are presented in Table 6.

Based on the table, Figure 6 shows the results of the linearity test to determine whether the SEM-GSCA model is feasible or not. The test results show that all causal variables have significant values on the influence variables. These results indicate that the SEM-GSCA model is suitable for this research. All variables have good validity for the construct or latent variable if the t-value of the factor loading is greater than the critical value (≥ 1.96) and/or the standard factor loading is ≥ 0.05. Meanwhile, reliability evaluation with the measurement model in GSCA uses Construct Reliability (CR ≥ 0.70) and Average Variance Extracted (AVE ≥ 0.50). Next, the measurement model analysis uses the method used, namely Confirmatory Factor Analysis (CFA).

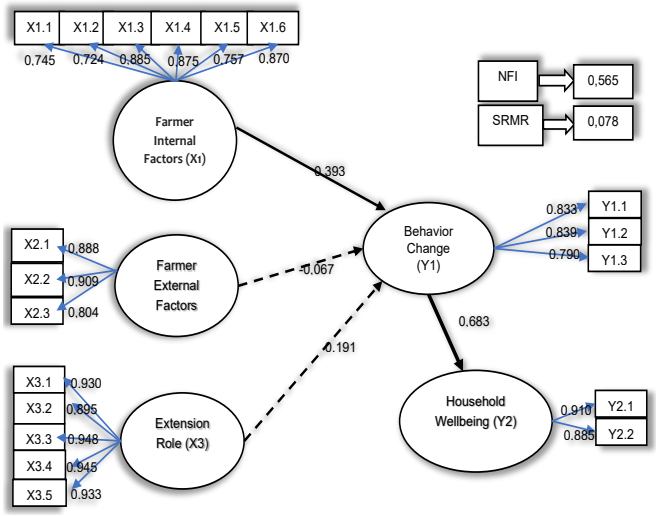


Figure 6. Influence between Research Variable Models

Table 6. Linearity test results

Variable relationship patterns			P value (Linearity)	Conclusion
Causal Variables	has	Consequence Variables		
Farmer Internal Factors (X1)	has	Behavior Change (Y1)	0,000	Liner
Farmer External Factors (X2)	has	Behavior Change (Y1)	0,000	Liner
Extension Role (X3)	has	Behavior Change (Y1)	0,000	Liner
Changes in Farmer Behavior (Y1)	has	Household Wellbeing (Y2)	0,000	Liner

Table 7. Evaluation of the Exogenous Variable Measurement Model

Leave Out Variables	Observe Variables	Partial Validity (Goods) (LF>0.5=Sah)		Rank	Generally valid (Build) (AVE > 0,5= sah)		Cronbach Reliability (CR>0,7	
		Outside load	Is		BIRD	Conclusion	NOK	Information
Farmer Internal Factors (X1)	X1.1	0,745	Valid	4	0,659	Valid	0,908	Rehabilitation
	X1.2	0,724	Valid	5				
	X1.3	0,888	Valid	1				
	X1.4	0,875	Valid	2				
	X1.5	0,757	Valid	3				
	X1.6	0,875	Valid	2				
Farmer External Factors (X2)	X2.1	0,888	Valid	2	0,699	Valid	0,949	Rehabilitation
	X2.2	0,909	Valid	1				
	X2.3	0,804	Valid	3				
Extension Role (X3)	X3.1	0,930	Valid	4	0,830	Valid	0,985	Rehabilitation
	X3.2	0,895	Valid	5				
	X3.3	0,948	Valid	1				
	X3.4	0,945	Valid	2				
	X3.5	0,933	Valid	3				
Behavior Change (Y1)	Y1.1	0,833	Valid	2	0,644	Valid	0,931	Rehabilitation
	Y1.2	0,839	Valid	1				
	Y1.3	0,790	Valid	3				
Household Wellbeing (Y2)	Y2.1	0,910	Valid	1	0,767	Valid	0,939	Rehabilitation
	Y2.2	0,885	Valid	2				

***Finding Factors for Changing Farmer Behavior in Shifting Farming ActivitiesDayak Tunjung Tribe Farmers in Barong Tongkok District*:** Analysis of determinants that influence behavioral changes in shifting cultivation activities in Barong Tongkok District, West Kutai Regency using SEM-GSCA analysis. In general, path analysis can be carried out by designing a measurement model and a structural model to form a path diagram to determine the influence of each variable, the path coefficient in the structural model and the weight values of the manifesto variable factors in the measurement. This model can be described through a measurement model path diagram and structural model as follows:

Based on Figure 5.12 and the results of the analysis, it shows that changes in farmer behavior (Y1) have a positive and significant effect on the welfare of farmer households (Y2). Farmer Internal Factors (X1) have a positive and significant effect on changes in farmer behavior (Y1), Farmer External Factors (X2) and the Role of Extension Officers (X3) do not have a significant effect on changes in farmer behavior (Y1).

Model testing, the procedure is carried out in several stages. The first stage is designing a structural model, the second stage is designing a measurement model, the third stage is creating a path diagram, the fourth stage is constructing the path diagram into an equation, the fifth stage is estimating parameters, and the sixth stage is Goodness of Fit testing, and the final stage is hypothesis testing. Because the seven stages have been carried out and the results meet the model evaluation criteria. To see the results of the Goodness of Fit model fit test, see Table 8. This fit test is intended to evaluate in general the degree of fit or Goodness of Fit between the data and the model. GOF statistical test, then a fit analysis can be carried out on the entire model as follows:

Table 8. Goodness of Fit Results.

Good Fit	Results	Information
NFI	0,565	Model Suitable
SRMR	0,078	Model Suitable

NFI = shows a value of 0.565, where the value is close to 1, so the results show that the model is fit. SRMR = shows a value of 0.078 where the average value of all residuals is standardized and has a range of 0 to 1. The model has good fit and is declared fit.

The next stage is hypothesis testing. The variable relationship is not significant if the critical ratio (CR) value is between -1.96 and 1.96 or by comparing the alpha value (0.05). The test was carried out using the GSCA software program to obtain an estimate of the critical ratio value of the structural model. The results of calculating the value of each relationship coefficient between variables can be seen in Table 9.

Based on table 9, it is known that changes in farmer behavior (Y1) are significantly influenced by internal factors of farmers (X1), while external factors of farmers (X2) and the role of extension workers (X3) do not significantly influence changes in farmer behavior (Y1). Hypothesis testing is done by comparing the path coefficient value with a CR value > 1.96 or by comparing the p <q value at a significance level of 0.05

DISCUSSION

***The Influence of Farmers' Internal Factors on Changes in the Behavior of Dayak Tunjung Tribe Farmers in Shifting Agricultural Activities*:** Based on the results of the structural model analysis, it is known that overall the farmer's internal factor variable (X1) has a positive influence on the farmer behavior change variable (Y1), where the path coefficient obtained is 0.39 with a CR value of 2.99. Because the CR value is greater than the critical value (2.99 > 1.96), the statistical hypothesis states that H0 is rejected, meaning that the farmer's internal factor variable (X1) has a significant influence on the farmer's behavior change variable (Y1). Based on the results of the research, it shows that the indicators supporting the farmer's internal factors (X1) studied include farmer age (X1.1), farmer education (X1.2), farmer experience (X1.3), farmer land status (X1.4), area farmer's land (X1.5), and number of farmer family members (X1.6)

Other internal factors of farmers such as age are also very helpful in changing farmer behavior, the more mature a person is in working, especially in carrying out shifting cultivation activities and the more effective they are in finding solutions when farmers experience problems in farming and looking for solutions. for information related to agricultural technology in farming. The older the farmer, the more experience and mindset the farmer has in developing shifting agricultural activities. Farmer education also has a big

Table 9. Results of Estimation and Testing of Researcher Modifiers.

Influence between latent variables			Hypothesis	Path coefficient	NOK	P value	Conclusion
Was. Exogenous	has	Is. Endogenous					
Farmer Internal Factors (X1)	has	Changes in Farmer Behavior (Y1)	H1	0,39	2,99	0,003	Important
Farmer External Factors (X2)	has	Changes in Farmer Behavior (Y1)	H2	-0,06	0,43	0,664	Not significant
Extension Role (X3)	has	Changes in Farmer Behavior (Y1)	H3	0,19	1,83	0,067	Not significant
Changes in Farmer Behavior (Y1)	has	Household Wellbeing (Y2)	H11	0,68	6,34	0,000	Important
R square Y1					0,23		

Note: significant at alpha 0.05.

influence on changes in farmer behavior, where the higher the farmer's education level, the more effective their way of thinking is. Internal factors are significantly related to farmers' attitudes, while external factors are significantly related to the role of farmers. These factors as a whole can change farmers' behavior and actions in carrying out land management without burning as an effort to prevent peatland fires (Waldi *et al.*, 2019). Land ownership also greatly influences changes in farmer behavior in farming. Fulfilling the food needs of swidden farmers cannot be separated from the characteristics of the farmer's household. One of the characteristics of farming households that plays a very important role in meeting household food needs is the condition of the farmer, because it can describe the farmer's capacity to fulfill their food needs. The main characteristics of farmers are farmer age, education level, main occupation, number of family members and household income.

***The Influence of Farmers' External Factors on Changes in the Behavior of Dayak Tunjung Tribe Farmers in Shifting Agricultural Activities*:** Based on the results of the structural model analysis, it is known that overall the farmer external factor variable (X2) has a positive influence on the farmer behavior change variable (Y1), where the path coefficient obtained is -0.06 with a CR value of 0.43, so the CR value is smaller than the value critical (0.43 < 1.96), then the statistical hypothesis states that H0 is accepted, meaning that the farmer's external factor variable (X2) has an insignificant influence on changes in farmer behavior (Y1

Based on supporting indicators, farmers' external factors (X2) were examined, namely access to capital (X2.1), access to technology (X2.2) and market access (X2.3). As research from (Rasmikayati *et al.*, 2016), states that external factors that have a directly proportional relationship with market selection are distance to market, travel time to market, and government contribution. Meanwhile, internal factors in the form of level of trust, access to information, and activeness in participating in counseling, as well as external factors in the form of organizing outreach have no relationship with market selection. The role of extension workers still has very little influence on the shifting cultivation activities of the Dayak Tunjung Tribe community in Barong Tongkok District. Some of the information faced by farmers is that they have not been able to get good market access, the information problem is that agricultural technology is still limited, information on the need for agricultural technology in shifting agricultural activities is still limited. not yet implemented by farmers, extension workers are still weak in assisting farmers in applying agricultural technology information for agriculture. shifting agricultural activities so that farmers' interest in seeking agricultural technology information becomes weak.

Capital information is no less important for farmers. The availability of capital information can help farmers simplify and expedite the process of increasing their farming capital. Increasing farming capital will have an impact on increasing farming performance and will ultimately increase farming income as well. Market information is very important for farmers. Market information can help farmers in the process of selling their products and determining the most profitable prices for them. The more often farmers are able to obtain/access market information, the more farmers will know about promising market opportunities.

In an effort to overcome this problem, agricultural instructors in Barong Tongkok District are more active in participating in the shifting cultivation activities of the local Dayak Tunjung Tribe, and improving information services to farmers so that they can encourage and motivate farmers to explore and master agricultural technology information. related to shifting cultivation, so that farmers will more quickly access information sources on new agricultural technology and farmers will be able to apply new technology well and effectively. This means that it is hoped that the role of extension workers will be able to provide changes in farmers' mindsets to support training and guidance for extension workers to apply modern technology.

***The Influence of the Role of Extension Workers on Changes in the Behavior of Dayak Tunjung Tribe Farmers in Shifting Farming Activities*:** Based on the results of the structural model analysis, it is known that overall the role of instructor variable (X3) does not have a significant influence on changes in farmer behavior (Y1), where the path coefficient obtained is 0.19 with a CR value of 1.83, so the CR value is smaller than the value critical (1.83 < 1.96), then the statistical hypothesis states that H0 is accepted, meaning that the role of instructor variable (X3) has an insignificant influence on changes in farmer behavior (Y1).

Based on the role variable of the instructor (X3) studied, namely facilitator (X3.1), innovator (X3.2), motivator (X3.3), dynamist (X3.4), and educator (X3.5). To achieve this, good agricultural instructor performance is needed in helping farmers achieve quality levels of corn farming productivity (Bahua et al., 2010). In this research, agricultural instructors have not had a significant influence on the farming activities of the Dayak Tunjung Tribe community in Barong Tongkok District in farming. Farmers' satisfaction with the role of agricultural instructors is often contradictory, sometimes agricultural instructors have optimally carried out their duties, but have not been able to provide satisfaction to farmers (Effendi *et al.*, 2021). Supervisors have not been able to motivate farmers to develop their farming businesses and farmer groups. The role of extension workers as motivators is to help farmers obtain information about how to process their products, provide direction on how to cultivate land well, how to use technology, how to increase the added value of production, as well as providing examples and motivating farmers. regarding good farming methods, farmers and extension workers, the technology used in shifting agricultural activities still lacks much innovation and variation. The function of the extension agent as a facilitator

is to always provide solutions or convenience, both in the extension or teaching and learning process, as well as as an convenience in advancing the agricultural business. The role of extension workers as innovators is to encourage change or provide innovation in farming, practices or ways of working and also change farmers' mindsets, so that they can implement them. The hopes of shifting farmers in the Dayak Tunjung Tribe, Barong Tongkok District, agricultural instructors will help innovate information, technology, convenience, innovators in shifting agricultural activities to encourage farmers and shape changes in behavior and mindset of farmers in adopting better agricultural innovations to improve the welfare of farming households. Another factor that hinders the progress of farmers is the low level of education of the farming community so that they feel they have joined farmer groups where farmer groups usually provide new innovations regarding planting methods or other things (Faisal, 2020). The Agricultural Extension carried out regarding Technology for Making and Using Rice Straw Compost Fertilizer can be categorized as successful, where the effectiveness of behavior change can be categorized as very effective in the aspects of knowledge, attitudes and skills (Widiastuti *et al.*, 2018).

***The influence of changes in farmer behavior on the welfare of farmer households moving to the tunjung dayak tribe in barong tongkok district*:** Shifting cultivation is a form of traditional agricultural system that has become institutionalized and entrenched in the Dayak Tunjung people. As local wisdom, shifting farming systems are a natural and important thing to maintain local food security. Land shifting is a traditional agricultural pattern that is applied evaluatively by local communities in realizing food security. This confirms that farming activities are carried out on dry land (gardens). Gardening is done once a season (especially the rainy season) with a shifting land pattern. This pattern has become institutionalized, so it has become part of local culture. The local Tunjung Dayak community's farming system is an activity to fulfill basic needs (food). The influence of changes in farmer behavior (Y1) on the welfare of farmer households (Y2) based on the results of structural model analysis, it is known that changes in farmer behavior (Y1) have a positive influence on the welfare of farmer households (Y2), with the path coefficient value obtained being 0.68 with a CR value of 6.34, because the CR value is smaller than the critical value (6.34>1.96), the statistical hypothesis states that H0 is rejected, meaning that the farmer behavior change variable (Y1) has a real or significant influence on the welfare variable farmer households (Y2). This shows that increasing changes in farmer behavior (Y1) has a real effect on increasing household welfare in shifting cultivation activities.

Farmers feel the need for the presence of agricultural instructors to support shifting agricultural activities, the need for agricultural instructors regarding land use, plant fertilizer dosage according to plant needs, finding plant spacing, controlling pests and diseases and solving problems faced by farmers. farmer. Changing farmers' behavior cannot be done quickly but needs to be done continuously so that farmers have the awareness to change their own attitudes. Changes in farmer behavior are closely related to the presence of extension workers in providing assistance, the limited education of farmers is an obstacle, therefore the presence of agricultural extension workers is felt to be very helpful for farmers in carrying out shifting cultivation activities. In changing individual behavior according to the need for the presence of agricultural instructors to support their farming activities, the need for agricultural instructors is related to changes in farmer behavior, including farmers being willing to accept new things recommended by agricultural instructors, the extension methods applied by agricultural instructors are able to increase knowledge and skills. Farmer behavior is a function of a person's interaction with their environment. Therefore, agricultural instructors are present to provide counseling and provide motivation.

In increasing farmers' knowledge and skills to change behavior, agricultural instructors prepare various extension methods such as farmer courses and results demonstrations to encourage farmers' awareness of the importance of having new knowledge in managing shifting cultivation so that they are able to compete with farmers in the agricultural sector. The role of agricultural instructors is not only in terms of cultivation but also in facilitating cooperation between field farmers, making it easier for farmers to receive cooperation assistance and be able to compete at a wider level. Extension assistance is seen as important to make it easier for farmers to accept new things, therefore, with extension workers taking part in resolving the problems faced by plantation farmers, assistance is a necessity which is deemed necessary to accelerate the process of changing behavior. Farmers' attitudes that are open to change can increase creativity in farming. Apart from that, farmers' awareness of changes in farming methods, such as using farming methods recommended by extension workers, can encourage and increase farming productivity to improve the welfare of Dayak Tunjung tribe households in Barong Tongkok District. Increasing the household income of shifting cultivation farmers in Barong Tongkok District, namely that internal factors of farmers and external factors of farmers have a strong influence on each other to improve the welfare of farming households in the research location, helping farmers. Agricultural extension workers must be able to facilitate and guide farmers to communicate better with each other regarding availability of markets, availability of access to agricultural technology, and availability of access to capital, which so far agricultural instructors in Barong Tongkok District have not played a role. play an active role in shifting cultivation activities. Apart from that, training on the use of information technology in the form of the internet and its devices can develop local wisdom in farming activities and

can help farmers to increase family income with the aim of improving the welfare of farming households. To improve farmers' welfare, support from various parties is needed (government through agricultural extension workers, financial institutions, the private sector) to provide access to capital and price guarantees for Dayak Tunjung Tribe farmers in Barong Tongkok District. The statement to improve farmers' welfare requires policies to increase income through various aspects that support the improvement of the agricultural and non-agricultural sectors.

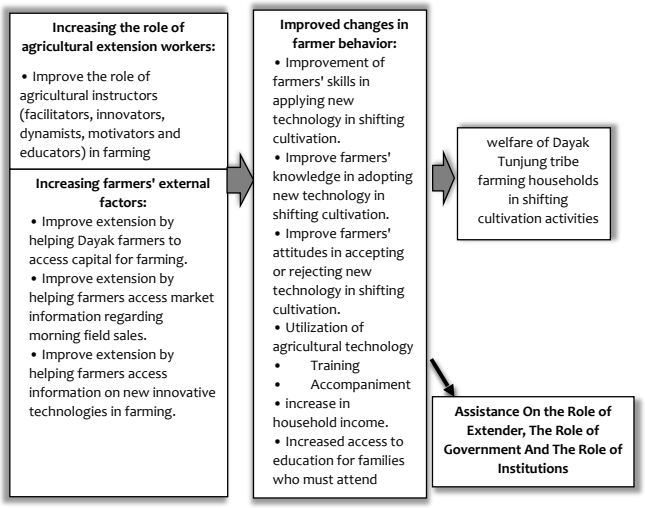


Figure 7. Model of gender-based agricultural extension and local wisdom in realizing the welfare of Dayak Tunjung tribe farming households

Model The role of extension workers can be designed to explain that through the role of extension workers, shifting cultivation activities carried out by farmers in the Dayak Tunjung Tribe community in Barong Tongkok District are able to improve the welfare of farmer households. The role of agricultural instructors is currently not running well. The low use of new technology in managing shifting cultivation is due to the fact that local farming communities are communities with low incomes and depend on the season. The use of agricultural technology is also one way to speed up processes and activities in farming activities. With technology, farming activities can be faster, more effective and efficient, but in conditions of shifting cultivation it is very difficult to change or apply new agricultural technology, because system of shifting cultivation patterns, thus greatly hampering the diffusion of new technology for farming activities.

Conclusion: Based on the results of the research and discussion, it can be concluded that the factors that influence changes in farmer behavior in improving the welfare of farmer households are: (1) internal factors of farmers which have a significant influence on changes in farmer behavior. Factors that do not influence changes in farmer behavior are: (1) external factors of farmers and (2) the role of extension workers does not have a real influence on the farming activities of the local Dayak Tunjung Tribe community. Changes in farmer behavior in shifting cultivation activities of the Dayak Tunjung community, namely knowledge (Y1.1), attitudes (Y1.2), and skills (Y1.3). All of these indicators have a real and large influence on improving the welfare of farmer households. This means that in improving the welfare of farming households, farmers are able to change farmers' behavior in carrying out shifting cultivation activities in Barong Tongkok District.

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***Data availability and materials*:** we declare that the manuscript we send is our scientific work, which has not been done before and is not currently being considered for publication elsewhere.

Confession: This research is important to conduct to see the extent of the role of extension workers in local wisdom in farming

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